

\$2.75 U.S.A.  
\$3.75 Canada

THE NEWEST, MOST INDEPTH MAGAZINE FOR TANDY'S COLOR COMPUTER 2 & 3


A black and white line drawing of a vintage computer system. It consists of a CRT monitor on top of a horizontal base unit. The base unit has a large rectangular opening on the left and two smaller square openings on the right. A coiled cable connects the base unit to a keyboard in the foreground. The keyboard has a numeric keypad on the left, a main alphanumeric keypad in the center, and a few function keys on the right.

# Claude Giguere's

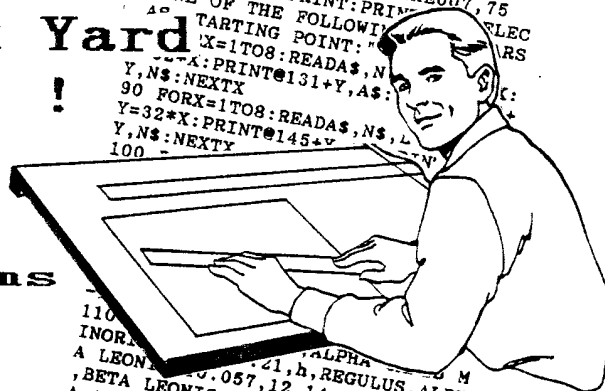
Initiation Au OS-9 Part One

# CoCo Controlled Back Yard Telescope - Part One !

10 YH=PEEK(60000):YT=PEEK(60001)  
D:=PEEK(60002):DT=PEEK(60003):Y  
=((YH\*100)+YT+((DH\*100)+DT)/365  
)  
20 FORX=1TO8:PR(X)=PEEK(60010+X)  
+(PEEK(60020+X)/100)+(PEEK(60030  
+X)/10000)  
30 PD(X)=PEEK(60040+X)+(PEEK(600  
50+X)/100)+(PEEK(60060+X)/10000)  
40 IFPEEK(60070+X)=0THENPD(X)=-P  
D(X)  
50 NEXTX  
60 POKE&HE005,75:POKE&HE007,75  
70 SU=0:CLS:PRINT:PRINT"ELEC  
T ONE OF THE FOLLOWING CARS  
TARTING POINT:"  
X=1TO8:READA\$,N\$:  
N\$:PRINT@131+Y,A\$:K:  
90 NEXTX  
90 FORX=1TO8:READA\$,N\$,L\$  
Y=32\*X-PRINT@145+v  
Y,N\$:NEXTY  
100



# Ron Simpson's Programs Plans & Diagrams

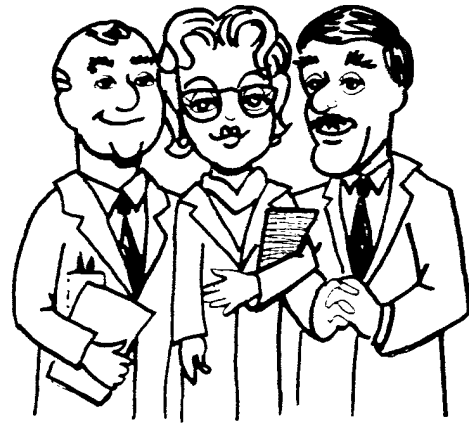


110  
INOR...  
A LEON...  
BETA LEONIS, 11.057, 12.14, h, REGULUS, ALPHA  
A, ALPHA VIRGINIS, 11.465, 14.51, i, DENEBOA  
ARCTURUS, ALPHA VIRGINIS, 13.226, -10.54, k  
26.1, ANTARES, ALPHA BOOTIS, 14.134, 19  
64, -28.19  
120 DATA



**In 1989,**  
Color Computer users  
just like you  
from across North America  
described their  
dream computer to us.

**In 1990,**  
Kenneth-Leigh Enterprises and  
a team of engineers and  
developers will introduce  
the computer you demanded.



Write to us for details  
and join the celebration!



Tell me more about the new computer!

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY/STATE/ZIP \_\_\_\_\_

Mail to: Kenneth-Leigh Enterprises  
Suite 10  
1840 Biltmore Street NW  
Washington, DC 20009

# CoCo Clipboard Magazine

VOL. 3 ISSUE 3 MAR./APR. 1990

## TABLE OF CONTENTS

### From The Desk of.....

*Just What Is Going On Here?* ..... Page 4

### Reader Mail

*Readers Comments and Thoughts* ..... Page 5

### CoCo Controlled Telescope Part 1

*Ron Simpson's Equitorial Mounted*

*CoCo Controlled Telescope Project* ..... Page 7

### The NEW CoCo's??

*Press Releases on the K.L.E., MM1*

*and the F.H.L. TomCat 9* ..... Page 17

### Introduction au OS-9

*avec Claude Giguere* ..... Page 13

Subscription Info - Page 12

ClipDisk Info - Page 11

Advertiser Index - Page 22

AS WE GO TO PRESS.... Well we're still trying to catch up, and we've gone to a newsletter style production, using more of our in house capability.

Coming up in the next few issues will be Boisy Pitre's ChurchBase (it's here in the office) as well as C.C.B.M.S. We will also have a large comprehensive review on C-III Pages by Coless Computers, and other new products.

CoCo Clipboard Magazine is published 6 times a year by CoCo Clipboard Magazine, 3742 U.S. 20 - Box 3, Fredonia NY 14063 (716) 679-0126. Our hours are 9am EST to 9pm EST Monday through Saturday. THE ENTIRE CONTENTS OF THIS MAGAZINE ARE COPYRIGHTED. NO PORTION OF THIS MAGAZINE OR CLIPDISK MAY BE REPRODUCED BY ANY MEANS INCLUDING BBS SYSTEMS EXCEPT BY EXPRESS WRITTEN PERMISSION OF THE PUBLISHER. Tandy, Extended Color Basic, Color Basic and Program Pak are registered trade marks of Tandy Corp. GENie is the registered trademark of General Electric Information Systems. CoCo Clipboard The Clipboard, Clipboard BBS systems, Clipper Koala, ClipDisk and Clipboard Convo are trademarks of CoCo Clipboard Magazine. Full refund after one issue and no refunds after two issues mailed. Change of address must be made at least 6 weeks prior to magazine mailing. The post office will NOT forward your magazine. Issues missed because of late notification will not be replaced free of charge.

## From The Desk Of...

*Ted & Darlene Paul*

"Survival of the fittest." That's a term which I don't necessarily apply to the natural world but one that certainly applies to the Color Computer Magazine world. We had to make a couple of hard decisions concerning the way we are able to publish *Clipboard*. They were not decisions that were taken lightly or quickly, but WE HAVE TO SURVIVE. These decisions and resulting change in the format and page count were made because there is too much new and exciting developments coming in the CoCo market. Until those changes are complete and while advertising revenues are down we doing what any business should do in order to survive. So much for the bad news let's get excited about what's coming up.

First we are presenting in this issue a terrific summer computer projects for all of you who enjoy star watching or comet finding - astronomy in general. Courtesy of Kalmbach Publications and Telescope Making Magazine, we are printing what we believe is the largest CoCo program and construction project ever. The results will have you operating a computer controlled telescope, driven by a program that will point the telescope to just about any point in the sky and then track it! Because of the length of the program listings, the diagrams and the article itself, we will break it down into three parts. I didn't want to do this but given the circumstances, we have no choice. In any case, the full program listing will be contained on each of the next three *ClipDisks*.

Second, Randy Krippner was going to do a series on PASCAL programming using the TCE Pascal package. That has been changed and will be presented in the late summer, early fall but will be written in BASIC09. We had almost no positive response to the PASCAL idea. Randy's programming project by the way will let you finally catalog all those video tapes you've collected this past year. "Not another video tape cataloger", you say? This will be something much more professional and faster than anything else you've seen. Randy has already written a commercial video store rental program.. he know's what he's doing!

Third, Jim Woodward an associate professor of mathematics at Lock Haven University will be featured in an upcoming

issue with a complete Math package for C. Jim has written articles for '68 Micro and has written programs to generate truth tables, change expressions into "Polish" notation and many other projects. Didn't I mention that we weren't going to mess around with recipe converters when you subscribed!

Fourth, As many of you know both Frank Hogg Labs and Kenneth-Leigh Enterprises are working on two new computers for the "upscale" CoCo user. Unless you're an avid BBS user, or were at that CoCo show in Chicago a couple of months ago, you're probably starving for information. Look no further! I've compiled press releases and BBS information on both machines and it's in this issue.

Since I've got to conserve space in this issue I'll wrap this up right now! See you all next issue!

Looking for the **BEST SERVICE, BEST SELECTION,**  
and **BEST PRICES** on your CoCo shopping needs?

# COCO PRO!

At CoCoPRO!, we bring you the best VALUE for your CoCo shopping dollar. We carry a wide variety of NEW hardware products at prices *too low* to advertise, gently USED hardware products (with full 30-day warranty), as well as something you will find *nowhere* else... gently USED SOFTWARE at INCREDIBLE savings (30-80%) over full retail (easy on the *wallet*, easy on the *conscience*)!! Our inventory changes daily, and contains at least 120 of your favorite CoCo software titles at all times!! All legitimate copies, with full documentation!!

HOW can you find out what bargains await you in our current inventory?

Send \$3 (refundable with \$20 purchase) for our Catalog on Disk, or \$10 for 12 monthly issues.

\* OR \*

If you have a modem, call our BBS for the latest listing of inventory, with **ONLINE ORDERING** via VISA/MC!! BBS no. is (313)663-6207 (5 lines, 7-E-1, 3-1200. Type "coco" at login prompt).

Call or write **TODAY...** before someone else gets that item you've been looking for!!

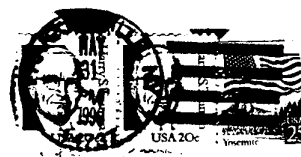
# COCO PRO!

1334 Byron  
Ypsilanti, MI 48198  
(313)481-DAVE(3283)

We accept VISA, MASTERCARD, Checks, and Money Orders. Credit Card orders, please add 5% to total. All orders shipped same day via UPS Ground. C.O.D. orders add \$4.00.

## Reader Mail

FIRST CLASS



Dear Ted & Darlene

First of all, let me thank you both for the magazine and ClipDisk. As a CoCo user and amateur radio operator (call sign VO1BZ) there is always something of interest in every issue.

In that regard, let me recommend Monty Haley's CoCoPac for using the computer for packet radio. I spoke with him on the telephone before receiving the software package and he is a fine gentlemen.

Also, I enjoyed the Bible Quiz program in the Jan/Feb 90 issue. Having written a similar program myself, I was please to see it.

I look forward to each issue.

Sincerely,

Frank J. Burke  
St. John's, NFLD - Canada

Dear Frank

Glad you enjoyed Sebastian LaSpada's article and program. We are also looking for more writers in the Amateur Radio area as this is a growing field. Glad we have been of help to you!

Dear Ted:

Here are some notes to suppliment the telescope article:

1) I wrote the program on my CoCo I. While no problems have been experienced on my thirty dollar spare CoCo 2, I do anticipate that when running the program on a CoCo 3, there will be problems related to address calls in the machine language subroutines and the peripheral interface adapter.

2) In case is wasn't clear in the article, this system is made for equatorially mounted telescope only.

3) Since writing the article for TM38, I have made an addition to the program; mainly, a planetary position emphemeris program has been added to the initial-izing program to calculate the positions of all the planets for the night's observing session. The addition made the observing program so long that storage

can now be made only on tape, even though a "PCLEAR0" Poke is done in the initial-izing program (there is no memory available for the disc operating system).

4) In order to make both pushbuttons work on my deluxe Radio Shack joysticks, I had to perform some surgery to the joystick connectors in my CoCo's. Namely, the unused top center pin of each connector must be cut from its grounded point and connected via a jumper wire to pin 4 of the opposite connector. Note that this modification may void the warranty, or worse, that Radio Shack may refuse to service such a modified unit. As an alternative, the deluxe joystick may be modified by adding a connector for routing the unused fore button signal to the left joystick port.

5) Lines 60 and 820 of the second program must be tailored to fit the specific mechanical configuration of the telescope. The POKES of line 60 control the top speed of the steppers in the auto and manual slewing machine language subroutines. Line 820 converts slewing distances in hours of right ascension (R.A.) and degrees of declination into the number of pulses (divided by 256 for convenient POKeing later) required to move the telescope these distances through its gearing. As an example, the math on my system is as follows:

- \*  $482 \text{ tooth R.A. worm gear} \times (72 \text{ tooth}/48 \text{ tooth}) \text{ stepper-to-worm gear ratio} \times 400 \text{ half steps per motor rev.} = 289,200 \text{ pulses per rev. of R.A. shaft.}$
- \*  $289,200 \text{ ppr}/24 \text{ hrs/rev.} = 12,050 \text{ pulses / hour angle.}$
- \*  $12,050 \text{ pph}/256 = 47.0703125 \text{ conversion factor.}$
- \*  $472 \text{ tooth dec. worm gear} \times (72 \text{ tooth}/48 \text{ tooth}) \text{ stepper-to-worm gear ration} \times 400 \text{ half steps per motor rev.} = 283,200 \text{ pulses per rev. of dec. shaft.}$
- \*  $283,200 \text{ ppr}/360 \text{ geg/rev.} = 786 \text{ 2/3 pulses/deg dec.}$
- \*  $786 \text{ 2/3 ppr}/256 = 3.072916667 \text{ conversion factor.}$

Best Regards,

Ron Simpson  
Charlotte, NC

*New For the 90's*  
*From ORION Technologies...*

# XPort More..... for less.

THE extended port interface for the Coco 1, 2, or 3.  
 Get more than one good thing at a time.

## MORE

Slots ... Three cartridge slots.  
 Power ... 12 volts/powers anything.  
 Versatile.. Use RS232/disk and more  
 Mobility .. Moves out of the way for  
                   more desk space.  
 Reliability.. Buffered I/O for more  
                   signal strength.

## LESS

Cost...Intro priced!..only \$74.95  
 Cost... No need to replace what  
                   you already have.  
 Cost... No need to buy special  
                   software.  
 Hassle... No special addressing  
                   to contend with.

Xport will be available for shipment on or about December 1st....Orders are being taken now!

Brand Name	Double Sided Disk Drives	TEAC
	Factory new 5 1/2" 1/2 ht drives	
360K.....\$79.95		360K.....\$89.95
720K.....\$89.95	Dual Case/ Power supply..... \$59.95 Drive cables \$10.00 + \$2.50/ connector	720K.....\$99.95

**Telepak II ..... See Review November '89 issue! .....\$49.95**

The Telepak II is fast becoming the new standard for Color Computer RS232 communications. Baud rates to 19,200 baud. Comes complete with 3' DB25 cable that will connect directly with any standard modem or terminal. The latest in low power microchip technology. Does NOT require 12 volts. Gold connectors.

### 2400 bd Modem & cable only \$129.95

3/12/2400 baud. Auto-dial /answer.  
 AT command set. 2 year warranty and  
 6 foot cable. (4-pin or DB25- please specify)

### New 80 track-double sided drives---\$39.95!

Full height - Bare drives. Limited quantities.  
 Great for OS-9, Hyper I/O, and ADOS 3  
 Order yours now!

**UP DOS - Coco III DOS - What your Coco should have been born with. ONLY \$24.95**  
 Load/Save CM3-MGE grfx. Auto-boot even OS-9! Easy ML config prgm.  
 Choose Boot-up Screen width,palettes, baud rates, step rates,35/40 trk.

#### Alpha Software

Disk manager tree\$29.95  
 Multi-Menu.....\$19.95  
 OS-9 Level 2 BBS..\$29.95  
 Warp One.....\$34.95  
 Presto-Partner.....\$29.95  
 The Zapper.....\$19.95  
 Level II Tools.....\$24.95

V-term.....\$39.95  
 version 3.02. RSDOS

Supercomm..\$29.95  
 New! for OS-9 LH

#### Turbo 512K Ram Upgrade

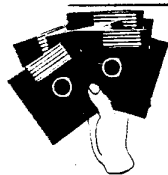
\*Premium 120ns RAM chips  
 \*Complete with installation  
 instructions and RamDisk,  
 Print spooler, & Ram test!  
**Only.....\$109.95**  
 OK board /software \$39.00

**Cables ..** 4-pin to DB25...\$12.95  
 (specify modem or printer)  
 DB25 M-M / M-F-6'..\$9.95  
 Magnavox RGB....\$14.95



Visa, MC, C.O.D. or your  
 personal check accepted.  
 Add \$3.00 shpg/hldg.  
 C.O.D. - add \$3.00  
 P.O. Box 63196  
 Wichita, KS 67203  
 316-946-0440

# CoCo Controlled Telescope Pt. 1



Ron Simpson

(Editor's Note: As mentioned in my opening column, we had originally planned on running Ron Simpson's entire program and article in one issue. This has become impossible. We will divide up the program, schematics and article into three sections. ClipDisk will have ALL of the program information on each of three corresponding disks. You should also note that Ron's original program is designed to run from a cassette based CoCo I or II. You may have to make some modifications in order to run on the CoCo III and/or with a disk based system. We would be pleased to publish your modifications for these areas.)

Some persons, especially those who are skilled in star hopping, might consider a computer controlled telescope to be the epitome of laziness. But when you build one yourself (out of frustration, perhaps, because can't seem to learn how to star-hop), you put all the work in up front.

My 10" f5.6 newtonian is testament to this fact, having first been constructed in 1976 with a horseshoe mount, which, as my first attempt at telescope making, left a lot to be desired. I had not yet learned that using long, thin wall aluminum channels for the members attached to the horseshoe can result in an instrument better suited as a seismograph.

The tube assembly, however, was a different matter, with the open-trussed tube sections being "scroungineered" from surplus jet aircraft engine components sometimes called "burner cans". These titanium sections were found at an aircraft salvage yard in Miami, where I lived at the time. I have been told that if these parts had not failed magnafluxing tests and had remained in service, they would have been worth about six thousand dollars each. As it was, I only paid six dollars per section.

The Coulter primary mirror, proven to be of excellent figure, is mounted in a nine-point floatation cell. The secondary is held by a spider assembly of three vane construction. I prefer the resulting six thin diffraction spikes over the four heavy spikes (really four pairs) that four vanes produce.

The finder was made from the only remaining objective of a pair of damaged 7x50 german binoculars found at a pawn

shop, and an eyepiece from a microscope. For crosshairs I have tried many different things, from hairs snatched from my sleeping (or so I thought) young daughter's head, to spider webs (The hard part is finding the spider after you've placed the first crosshair). But ball fine hair isn't fine enough, and spider webs collect dust and become brittle with time. Finally, I discovered that certain grey multiconductor wires contain a stripping cord composed of extremely fine but durable filaments. Two LED's, mounted at ninety degrees, are used to illuminate them.

## A NEW START

I enjoyed the optical performance of my scope for about five years, all the while lamenting its poor stability. When I decided to try my hand at astrophotography, I quickly realized that a new mount was a necessity. Since small computers were just coming on the scene, I thought that it would be ideal if I could use one to control the scope to find and photograph objects I may not even be able to see.

But first, I had to embark on a painfully slow journey to acquire the mechanical components for a new, rigid mount. I decided that I first had to have a lathe with which to make parts, and located an ancient belt driven one which could turn fourteen inches and had a six foot bed. With this machine I made two tap cut worm gears of approximately twelve inches diameter. I had decided to build what is known as a torque tube mount, in order to retain a ladderless observing height while elimination pier crash problems. To this end, I also made the taper roller bearing housings for both the declination axis and the right ascension axis (the torque tube). These axes were made to bolt to each other with flanges having push/pull bolts in order to provide adjustment for perpendicularity.

At this point, my company relocated to North Carolina, causing me to interrupt the project for about three years while getting settled. I had also sold my lathe before moving, believing (incorrectly) that I could find a better one in Charlotte. The mechanical portion of the project languished until I changed employ-

continued on 8

continued from 7

ment to a company with a well equipped machine shop and, fortunately, with minimal concerns about employees using the equipment after hours.

## THE ELECTRICAL HARDWARE

In the meantime, I decided to learn whether or not I could make a computer drive stepping motors. This was no small task, since not only did I not have a computer, but I didn't have the slightest idea how they worked. Even basic wasn't basic to me

I purchased a Radio Shack Color Computer (CoCo), of 64K memory, ostensibly for my children's Christmas present. Fortunately, they wouldn't have a thing to do with it. An entire year was spent in developing the program and designing and building an electrical interface unit that would drive the stepper motors.

(While a purist might turn up his nose at the thought of using the lowly (?) CoCo for such a purpose, there are some advantages, foremost of which is the fact that I can inexpensively replace the computer if it is damaged at a star party. I even bought a spare for thirty dollars at the swap table of our club's SOUTHERN STAR convention last year. Try that, Big Blue users!)

The interface unit connects to the CoCo through its game cartridge port, right on the data bus. A game cartridge was gutted for its case, and a gold plated card edge connector board and ribbon cable were added to connect the data bus to the interface unit housing a 6821 PIA (peripheral interface adapter). This device is programmed from basic to configure an eight bit group of data lines as outputs, which in turn light the LED portions of eight opto-isolators.

The power for the PIA and the LED's is derived from the CoCo game port, with the remaining power for the interface being

## PARTS LISTING, INTERFACE UNIT

C1	Capacitor, Electrolytic, 20K uF, 20VDC
C2	Capacitor, Electrolytic, 1 uF, 35VDC
C3	Capacitor, Ceramic Dipped, .33 uF, 50VDC
C4-C6	Capacitor, Ceramic Dipped, .01 uF, 50VDC
C7	Capacitor, Polyester Film, 1 uF, 600V
D1	LED, Power Indicator (*)
D2-D13	Diode, 1N4002
F1	Fuse, 1-1/2 Amp
L1,L2	Relay, Cornell Dubilier #603-12V
M1	Gearmotor, 12VDC (*)
M2	Gearmotor, Synchronous (*)
M3,M4	Motor, Stepper, 12VDC, Oriental Vexta #PH268-22
OSC1	Oscillator, 20 MHZ, Vectron #C0238
P1	Connector, Game Port (Ref.)
Q1-Q8	Opto-Isolator, #4N30
Q9-Q18	Transistor, Power, 2N3055
R1-R9	Resistor, 1K, 1/8 Watt
R10	Resistor, 6 Ohm, 25 Watt
R11-R26	Resistor, 470 Ohm, 1/8 Watt
R27-R32	Resistor, 100 Ohm, 1/8 Watt
R33-R42	Resistor, 270 Ohm, 1/4 Watt
REC1	Bridge Rectifier, General Electric #KBPC25-02
S1	Power Switch (*)
S2-S5	Switch, BCD Thumbwheel (*)
T1	Transformer, Stancor #P-8660
T2	Transformer, Signal #241-6-20
U1	PIA, #MC6821
U2,U3	Hex Inverter, Open Collector, #7405
U4	Voltage Regulator, #LM323
U5	Decade Counter, #74LS90
U6	Data Selector, #74LS157
U7-U11	Up/Down Counter, #74LS192
U12	J-K Flip/Flop, #74LS73
U13-U17	Dual Peripheral Driver, #75451

continued on 9

## Check Account Information System

Not just another checkbook program but a user friendly, menu driven, disk based information system. Keep track of deposits, checks, ATM withdrawals and other account transactions. Define up to 36 categories to monitor expenses. Set up automatic transactions for such items as direct deposits and deductions. Balance your accounts(s) in minutes! Other features include multi-drive capability, display & print options, check search on any field, edit & delete capability & more.

CoCo 3 compatible  
Printer Optional

After Five Software  
P.O. Box 210975  
Columbia, SC 29221-0975  
(803) 788-5995

Send check or M.O. for  
\$34.95 plus \$3.00 S/H  
COD orders; add \$2.00  
(SC res. add 5% sales tax)

UNTANGLE YOUR CHECKING ACCOUNT WITH CAIS



continued from 8

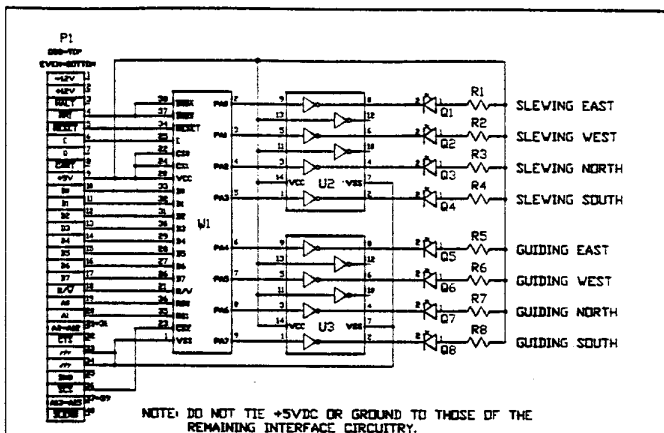


FIG. 1 - ELECTRICALLY ISOLATED SECTION

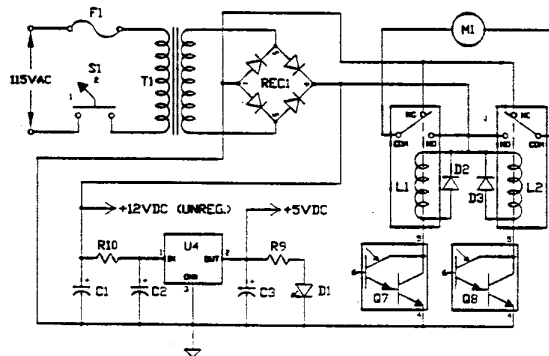


FIG. 2 - POWER SUPPLY &amp; DECLINATION GUIDING

- U18 Hex Schmitt Trigger Inverter, #7414  
 U19 Quad 2-Input Positive-Nand Gate, #7400  
 U20,U21 Up/Down Counter, #74LS193  
 U22,U23 BCD-to-Decimal Decoder, #74LS42  
 U24,U25 Quad 2-Input Positive-And Gate, #74LS08

(\*) = User's Option

derived from its own power supply. The opto-isolators serve to provide electrical isolation between the two power systems.

The power supply generates an unregulated 12VDC for the two stepper motors, the two declination motor relays, and the clock drive inverter transformer. This raw 12VDC also provides input power for the regulated 5VDC supply which powers the integrated circuitry.

For slow motion right ascension control, a crystal controlled oscillator drive corrector is employed similar to one first described by John B. West and Robert S. Bradford, Jr. in 'Sky and Telescope' magazine in August of 1975. Differences are that I used a monolithic 20MHZ crystal oscillator rather than the discrete com-

ponents described in the article which generated 2 MHZ. A 74LS90 decade counter was added to perform the required additional divide-by-ten operation. Also, the fast and slow push button switches were replaced with the aforementioned opto-isolators driving schmitt trigger inverters to allow use of the computer's joystick for guiding.

Slow motion declination control is performed by using two of the opto-isolators to energize either of two miniature relays to power the declination guiding motor. The relays and the motor are 12VDC units.

For slewing in right ascension and declination, two identical circuits were constructed to convert pulse trains generated by the computer into the required four wire sequence for stepping the two motors in half step mode. The selection of axis and direction of rotation is determined by which data line is being pulsed (via the four remaining opto-isolators), and the distance slewed is controlled by the number of pulses sent.

continued on 10

## BOWLING LEAGUE SECRETARY © 1986

REVIEWED BY:

CO-CO  
 CLIPBOARD  
 July/Aug 1989



RAINBOW  
 Sept 1986  
 April 1987

FOR CO-CO 1, 2, OR 3 WITH MINIMUM OF 32K, DISC DRIVE, AND PRINTER

- \*User friendly--full menu-driven selections
- \*Any number of teams, over 200 bowlers
- \*Calculates and stores all team and bowler statistics
- \*Handles standard 10-pin or Canadian 5-pin scoring
- \*Men, women, mixed, scratch or handicap; blinds and substitutes
- \*Start up any time in season
- \*Full edit capabilities for team and bowler records
- \*Automatic paper and disc backups and weekly, mid-season and new-season file resets
- \*ABC/WIBC style printouts
- \*Includes 20-page instruction manual
- \*Upgrades available for Tally Sheets, Pins over Average, Alphabetic or Average Listings. Send for details/catalog.

Priced at \$49.95, which includes S&H & Sales Tax. To order, send check or money order. Specify Version 1.0 for all men or all women leagues; Version 1.1 for mixed leagues.

TOMELA\*CO

P.O. Box 2162, Doylestown, Pa 18901-2162

Phone (215)-348-5822

E-Mail: Delphi User Name TOMBARN

Compuserve User I.D. 76662,1635

## THE SOFTWARE

The computer program is loaded in via a tape recorder. Once again, the purist might question why a disc drive isn't used. The answer lies in the fact that, on the CoCo, the disc controller plugs into the game cartridge port already dedicated to the telescope interface connector. A 'Y' cable could be used to connect both devices, but the time required to load the program from tape is not excessive, and a disc drive would be more subject to damage in transport, since I use a trailer to carry both the scope and the computer control system.

The program currently consists of two parts; a polar alignment program, and an observing program. Both are reproduced herein, with the bulk of the data in the observing program being omitted for brevity. Apologies are made for the absence of remarks, but this was done intentionally in order to leave as much room as possible for data.

```

10 YH=PEEK(60000):YT=PEEK(60001)
:DH=PEEK(60002):DT=PEEK(60003):Y
D=(YH*100)+YT+((DH*100)+DT)/365
)
20 FORX=1TO8:PR(X)=PEEK(60010+X)
+(PEEK(60020+X)/100)+(PEEK(60030
+X)/10000)
30 PD(X)=PEEK(60040+X)+(PEEK(600
50+X)/100)+(PEEK(60060+X)/10000)
40 IFPEEK(60070+X)=0THENPD(X)=-P
D(X)
50 NEXTX
60 POKE&HE005,75:POKE&HE007,75
70 SU=0:CLS:PRINT:PRINT" SELEC
T ONE OF THE FOLLOWING STARS
AS STARTING POINT:"
80 FORX=1TO8:READA$,N$,L$,RX,DX:
Y=32*X:PRINT@131+Y,A$:PRINT@133+
Y,N$:NEXTX
90 FORX=1TO8:READA$,N$,L$,RX,DX:
Y=32*X:PRINT@145+Y,A$:PRINT@147+
Y,N$:NEXTX
100 DATA a,ALPHERATZ,ALPHA ANDRO
MEDAE,.058,28.49,b,HAMAL,ALPHA A
RIETIS,2.043,23.14,c,ALDEBARAN,A
LPHA TAURI,4.33,16.25,d,RIGEL,BE
TA ORIONIS,5.122,-8.15,e,BETELGE
USE,ALPHA ORIONIS,5.525,7.24,f,S
IRIUS,ALPHA CANIS MAJORIS,6.429,
-16.39
110 DATA g,PROCYON,ALPHA CANIS M
INORIS,7.367,5.21,h,REGULUS,ALPH
A LEONIS,10.057,12.14,i,DENEbola
BETA LEONIS,11.465,14.51,j,SPIC
A,ALPHA VIRGINIS,13.226,-10.54,k
,ARCTURUS,ALPHA BOOTIS,14.134,19
.26,l,ANTARES,ALPHA SCORPII,16.2
64,-26.19
120 DATA m,VEGA,ALPHA LYRAE,18.3
52,38.44,n,ALTAIR,ALPHA AQUILAE,

```

```

19.483,8.44,o,DENEb,ALPHA CYGNI,
20.397,45.06,p,FOMALHAUT,ALPHA P
ISCIS AUSTRINI,22.549,-29.53
130 X$=INKEY$:IFX$=" "THEN130
140 IFX$<CHR$(65) OR X$>CHR$(80)
THEN130
150 I$="ABCDEFGHIJKLMN":FX=INS
TR(1,I$,X$)
160 RESTORE:FORX=1TOFX:READA$,N$
,L$,RX,DX:NEXTX
170 CLS:PRINT:PRINT:PRINT" 195
0 COORDINATES OF":PRINT" L$"
ARE:"PRINT" R.A. (HH.MMM) "":
PRINTUSING"###.###":RX:PRINT" D
EC. (DD.MM) "":PRINTUSING"###.##
#":DX:EP=1950
180 GOSUB620:IFX$="R"THEN70
190 SU=1:AC=0:KO=0:CLS:PRINT@35,
"OBJECTS CAN BE LOCATED BY":PRI
NT@135,"COORDINATE ENTRY":PRINT@
199,"OBJECT DESIGNATION":PRINT@2
63,"SEMI-AUTOMATIC SLEWING":PRIN
T@327,"AUTOMATIC SLEWING":PRINT@
457,"WHICH METHOD?"
200 CP$=INKEY$:IFCP$="C"THENL$="
CURRENT":GOTO250
210 IFCP$="O"THEN260
220 IFCP$="S"THEN410
230 IFCP$="A"THEN AC=1:GOTO410
240 GOTO200
250 CLS:PRINT@99,"ENTER COORDINA
TES AND EPOCH OF DESIRED OBJ
ECT:"INPUT" R.A. (HH.MMM)":RX
:INPUT" DEC. (DD.MM) ":DX:INPU
T" EPOCH (YYYY) ":EP:GOTO580
260 CLS:PRINT@3,"ENTER DESIGNATI
ON OF OBJECT (MXXX, NGCXXX):
":INPUT$
270 Z$="S":IFO$="MERCURY"THENRC=
PR(1):DC=PD(1):GOTO580
280 IFO$="VENUS"THENRC=PR(2):DC=
PD(2):GOTO580
290 IFO$="MARS"THENRC=PR(3):DC=P
D(3):GOTO580

```

```

300 IFO$="JUPITER"THENRC=PR(4):D
C=PD(4):GOTO580
310 IFO$="SATURN"THENRC=PR(5):DC
=PD(5):GOTO580
320 IFO$="URANUS"THENRC=PR(6):DC
=PD(6):GOTO580
330 IFO$="NEPTUNE"THENRC=PR(7):D
C=PD(7):GOTO580
340 IFO$="PLUTO"THENRC=PR(8):DC=
PD(8):GOTO580
350 PRINT@233,"scanning files":R
ESTORE:GOSUB570:POKE65495,0:FORX
=1TO1000:READL$,RX,DX,Z$
360 IFZ$="END"THEN400
370 IFZ$="CN"THENCN$=L$
380 IFL$=O$THEN500
390 NEXTX
400 POKE65494,0:RESTORE:GOSUB570
:PRINT@227,"this object not on f
ile":SOUND1,40:GOTO190
410 CLS:PRINT@34,"ENTER OBJECT C
LASS DESIRED":PRINT@103,"aLL OBJ
ECTS ON FILE":PRINT@167,"MESSIER
OBJECTS ONLY":PRINT@231,"DIFFUS
E NEBULAE":PRINT@295,"GALAXIES":
PRINT@359,"cLUSTERS, GLOBULAR":P
RINT@423,"oPEN CLUSTERS":PRINT@4
87,"pLANETARY NEBULAE":
420 TS=INKEY$:IFT$="A"ORT$="D"OR
TS="G"ORT$="C"ORT$="O"ORT$="P"OR
TS="M"THEN430ELSE420
430 READL$,RX,DX,Z$
440 IFZ$="END" THEN RESTORE:GOSU
B570:GOTO430
450 IFZ$="CN"THENCN$=L$:GOTO430
460 IFT$="M"ANDLEFT$(L$,1)="M"TH
EN490
470 IFT$="A"THEN490
480 IFT$>Z$THEN430
490 CLS:PRINT@3,"NEXT OBJECT ON
FILE IS":PRINT@35,L$
500 IFZ$="G"THENY$="GALAXY"
510 IFZ$="C"THENY$="GLOBULAR CLU
STER"
520 IFZ$="O"THENY$="OPEN CLUSTER
"
530 IFZ$="P"THENY$="PLANETARY"
540 IFZ$="D"THENY$="DIFFUSE NEBU
LA"
550 IFZ$="CN"THENY$="CONSTELLATI
ON"
560 PRINT@99,"1950 COORDINATES O
F THIS":PRINT@131,Y$" LOCATED IN
":PRINT@163,CN$ ARE:PRINT@195
,"R.A. (HH.MMM) ":PRINTUSING"##
.###":RX:PRINT@227,"DEC. (DD.MM)
":PRINTUSING"###.###":DX:EP=19
50:GOTO580
570 FORX=1TO80:READJ$:NEXTX:RET
URN
580 GOSUB610
590 IFKO=1THENKO=0:GOTO430
600 GOTO190
610 IFZ$="S"THENPRINT@163,"CURRE
NT COORDINATES FOR":PRINT@195,O$
" ARE:":L$=O$:RM=((RC-INT(RC))*
.6)+INT(RC):DY=ABS(DC):DM=((DY
-INT(DY))* .6)+INT(DY))*SGN(DC):G
OTO720

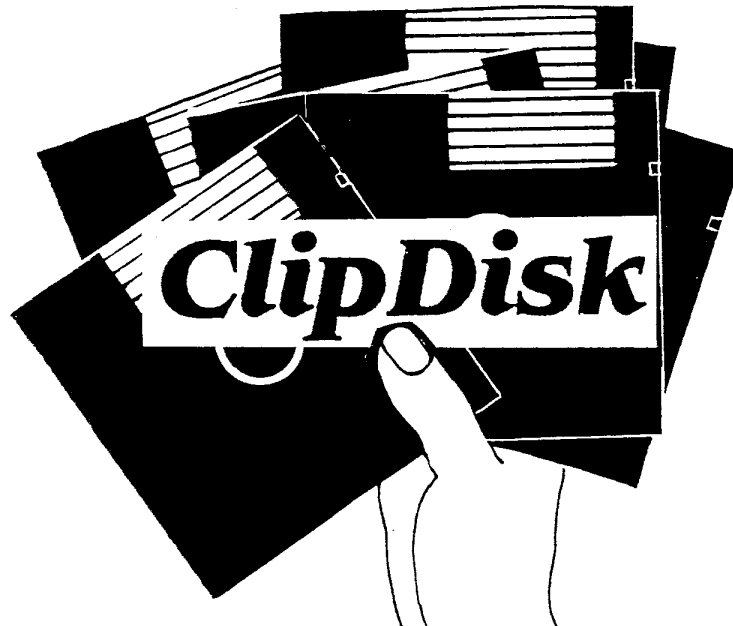
```



This program is available on *ClipDisk*. A single issue is just \$9.95, a full year is only \$49.95. Phone orders are accepted at (716) 679-0126 - please have your credit card ready. You may also order by mail by enclosing your check or money order to *CoCo Clipboard Magazine*. Our address is 3742 U.S. 20, Box 3, Fredonia, NY 14063 U.S.A. Slightly higher prices for overseas orders.

# CCMDisk Service

PRESENTS



## FULL YEAR (6 issues) Only \$49.95 !

In a world where *TIME* is in short supply, *ClipDisk* saves you time and prevents frustration!

A subscription to *ClipDisk* is just \$49.95 for a FULL year (6 issues)! Single issues are available as well for just \$9.95. Of course in order to get the full benefit of *ClipDisk* you'll need the corresponding issue of *Clipboard*.

All the BASIC, Assembly, BASIC09, PASCAL and C listings in each issue of *Clipboard* are available each month in *ClipDisk*. No more typo's or late night de-bugging and our easy to use OPENING MENU let's you select the program with the keyboard arrow keys.

*ClipDisk* is mailed first class - start your subscription today!

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State/Prov: \_\_\_\_\_  
Zip/Postal Code: \_\_\_\_\_

Please charge my purchase to my (circle) VISA / MasterCard / Discover Card.

MasterCard Interbank Number

--	--	--	--	--	--

Card # \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_



PLEASE NOTE: All charge card orders are handled courtesy of On-Line Computer Services. Your charge card billing will show On-Line Computers and NOT CoCo Clipboard Magazine.

**CoCo Clipboard Magazine**

3742 U.S. 20, Box 3, Fredonia, NY 14063

# CoCo Clipboard Magazine

Published Bi-Monthly

THE NEWEST, MOST IN-DEPTH MAGAZINE FOR TANDY'S COLOR COMPUTER 2 & 3

If you've been looking for a CoCo magazine that takes a No Nonsense approach to the Color Computer, then CoCo Clipboard Magazine is for you!

If you're getting tired of lo-res block graphics applications, reviews that still leave you guessing, and the same old boring approach to serious computing, then CoCo Clipboard Magazine is for you!

Clipboard brings you solid articles, programs and tutorials on BASIC, OS9, BASIC09, "C," MultiView, Machine language, databases, packet radio - the list goes on and on. Plus we're up-to-date on what's happening with the CoCo. We were the first to bring you IN-DEPTH reviews on VIP Writer III, RGB Hard Drives and Tandy, Home Publisher

**6 - 2 - 1**

**\$90.00**

#### SAVE 15% FROM LIST PRICE

Our best money saving offer yet, it's 6-2-1! "6-2-1" is our best way to save you money! Six back issues of *Clipboard*, a two-year subscription to *Clipboard* AND a one year subscription to *ClipDisk*. Normally \$106.95, now you can save 15%, only \$90.00! To order simply check the "6-2-1" box on the order form or call (716) 679-0126.

**MC - VISA - Discover accepted.**

**And now you can phone in your order!**  
**We accept VISA, MasterCard and Discover - (716) 679-0126 - 9 a.m. to 9 p.m. Monday thru Saturday!**

I am: \_\_\_\_\_ Subscribing

\_\_\_\_\_ Renewing

\_\_\_\_\_ Gift Subscription

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State/Prov: \_\_\_\_\_

Zip/Postal Code: \_\_\_\_\_

★ ★

**ONLY \$38.00**

★ ★

To SUBSCRIBE and  
receive **5 Recent  
BACK ISSUES**

All orders must be paid in U.S. Funds

★★	_____	1 year Clipboard in U.S.A.	\$18.00	_____
	_____	2 year Clipboard in U.S.A.	\$34.00	_____
	_____	1 year Clipboard in Canada	\$21.00	_____
	_____	1 year Clipboard all Foreign	\$27.00	_____
	_____	6-2-1 Special in U.S.A.	\$90.00	_____
	_____	6-2-1 Special in Canada	\$97.25	_____
	_____	6-2-1 Special all Foreign	\$116.00	_____
	_____	5 most recent back issues U.S.A. or Canada	\$20.00	_____
★★	_____	5 most recent back issues all Foreign	\$27.00	_____
	_____	1 year ClipDisk U.S.A. or Canada	\$49.95	_____
	_____	1 year ClipDisk Foreign	\$55.95	_____
		<b>TOTAL</b>		_____

Please charge my purchase to my (circle) VISA / MasterCard / Discover Card.

MasterCard Interbank Number

--	--	--	--



Card # \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_



PLEASE NOTE: All charge card orders are handled courtesy of On-Line Computer Services. Your charge card billing will show On-Line Computers and NOT CoCo Clipboard Magazine.

**CoCo Clipboard Magazine**

3742 U.S. 20, Box 3, Fredonia, NY 14063

# Initiation au OS-9

*Claude Giguere*

*(Editor's Note: Once again we are pleased to present Claude Giguere's column in French! Because this is an introductory column on OS-9 it will run over the next several edition. We welcome letters to Claude from our French speaking readers. Please feel free to send them to our offices and we will forward them to Claude in Canada.)*

Qu'est-ce que le OS9?

Le OS9 a pour lui de multiples avantages. Développé à l'origine sur microprocesseur 6809 (d'où le nom : Operating System 6809), il fut le premier système d'exploitation multitâche disponible sur micro 8 bits à présenter une syntaxe très proche de celle d'Unix. La première chose que l'on constate lorsqu'on utilise ce système d'exploitation c'est sa rapidité d'exécution. Celle-ci tient à plusieurs facteurs : compacité du code objet, gestion des entrées/sorties très performante parce qu'écrite en assembleur. Le OS9 s'avère un des rares environnements qui soient entièrement ou partiellement "ROMables", c'est-à-dire intégrables dans des systèmes pour lesquels modularité de l'architecture, d'une part, et robustesse au niveau des conditions extérieures, de l'autre, sont des impératifs. Cette "ROMabilité" est possible parce que tout le code OS9 est réentrant. Par ailleurs, le code objet exécutable est organisé sous forme de modules mémoire largement indépendants les uns des autres, ce qui conduit à adopter une programmation proche de la machine. Enfin, pour clore cette apologie descriptive, la compatibilité Unix n'est pas un vain mot. Elle se situe tant au niveau des sources rédigées en C qu'à celui des fonctions de la bibliothèque C, le mode d'appel de ces fonctions étant lui-même similaire à celui que l'on trouve en C sous Unix. Autrement dit, certaines des fonctions du Shell OS9 possèdent une syntaxe "unixienne", notamment en ce qui concerne la gestion des canaux (pipes), la redirection des entrées/sorties, l'accès à la multi-programmation et l'utilisation de caractères passe-partout (joker) dans les noms de fichiers, ainsi que dans la gestion d'un environnement de programmation.

Mais entrons plus avant dans l'étude de ce système. A ce stade, il nous faut faire une remarque liminaire : un choix s'imposait en effet. Ou bien nous décrivions son architecture tout en y adjoignant les fonctionnali-

tés correspondantes (ce qui offrait l'avantage d'être simple mais pas forcément clair), ou bien nous éclatons cette analyse en deux parties, la première consacrée à l'analyse fonctionnelle du produit, la seconde à son analyse organique. C'est un peu comme lorsque quelqu'un apprend à conduire. Pas besoin de savoir ce qu'il y a sous le capot pour se rendre vite compte qu'une automobile peut aller à diverses vitesses et qu'elle dispose d'un système de freinage. C'est un peu dans cette optique que nous avons composé cette étude.

Analyse fonctionnelle de la gestion du multi-tâche

En premier lieu, il est bon de rappeler ce qu'est un système multitâche. Un processeur n'est capable de faire qu'une seule chose à la fois. Aussi, pour créer la sensation de besoins multiples s'exécutant simultanément, se sert-on de l'horloge interne du CPU pour séquencer des interruptions. Celles-ci surviennent au bout d'un délai très court. Ce délai est également appelé 'tick', l'interruption va déclencher un programme qui appellera le fameux séquenceur. Que va faire ce dernier? Tout simplement sauvegarder l'état de la machine, c'est-à-dire le contenu de tous les registres dans une structure de type pile FIFO (First In First Out ou premier entré, premier sorti), et ce dans le contexte d'exécution de chaque fonction. C'est particulièrement facile pour le 6809 puisque l'un de ses registres pointe en permanence sur le contexte de la tâche en cours d'exécution. Au niveau du système, on dispose de plus d'une liste des besoins actives à un moment donné. Une fois la précédente sauvegarde effectuée, le séquenceur n'aura plus qu'à prendre la fonction active suivante, à charger dans le processeur les registres de celui-ci avec les valeurs concernant ladite commande, puis à relancer l'exécution de celle-ci au point où elle s'était arrêtée lors de sa précédente interruption, et ce jusqu'à l'interruption suivante qui déclenche à nouveau le processus d'archivage du contenu des registres ou encore jusqu'à ce que la commande signale qu'elle est arrivée à sa fin. Il existe d'ailleurs une primitive OS9 spécialement prévue à cet effet. Prenons, pour illustrer notre propos, le cas du retour-chariot tapé au clavier. La console l'enverra à l'unité

continued on 14

continued from 13

centrale sous forme de paquet, ce qui engendrera une interruption qui, à son tour, permettra de prendre ledit paquet de données et de le positionner correctement pour être pris en compte par le processus en cours de fonctionnement sur le terminal émetteur. Ainsi quand une tâche se met en attente d'une entrée, elle se met automatiquement en sommeil et ne sera réveillée que sur interruption engendrée par le dispositif sur lequel elle s'est mise en attente.

## La mise en sommeil

Qu'entend-on au juste par mise en sommeil? Le OS9 dispose pour ce faire de plusieurs listes. La première est constituée de la liste des tâches actives et liste des tâches passives pour lesquelles à un moment donné le processeur divise son temps. Quand une de ces tâches se met en sommeil soit pour un temps donné, soit dans l'attente d'une entrée spécifique, elle demeure "engourdie" jusqu'à ce qu'elle reçoive un message d'acquiescement lui signalant qu'elle peut continuer ou plus exactement reprendre son activité. Cela signifie concrètement que la tâche considérée, présente au départ dans la liste des tâches actives, va passer dans une autre liste, baptisée à juste titre liste des fonctions en sommeil. En fait, le OS9

va même jusqu'à gérer plusieurs listes de ce type. C'est ainsi que l'on dispose d'une liste des tâches sommeillant pour une durée fixée et une liste de celles attendant une entrée concernant le dispositif sur lequel elles tournent (ceci au niveau d'un 'device driver'). Prenons le cas d'une imprimante. Ici, le programme qui gère ce type de périphérique procède comme suit: il commence par envoyer les caractères en provenance du clavier, d'un fichier ou de la mémoire centrale dans un tampon spécifique à l'imprimante. Quand ce tampon s'avère plein, le processus se met en sommeil jusqu'à ce qu'il reçoive un message lui signalant que le tampon est désormais vide. Cette entrée réactivera le processus qui remplira à nouveau le tampon, et ainsi de suite. Il faut noter ici que le spooler (tampon) du OS9 fait partie des tâches automatiquement activées dès que l'on met un caractère dans le tampon de l'imprimante, le processus étant géré par le biais d'une file d'attente. Mais, ainsi que nous le disions plus haut une tâche active peut également être mise en sommeil pour une durée déterminée. Ici, à chaque fois que l'horloge du système s'incrémente d'un tick, le séquenceur regardera s'il n'y a pas des processus dans la file d'attente d'événements horloge. Si la tâche examinée s'avère en tête de cette file, elle sera alors placée en queue de la file d'attente des tâches actives. Mais de la même manière, une tâche peut se mettre en sommeil dans l'attente d'un événement qui sera activé par une autre tâche. C'est ce que l'on appelle le principe des sémaphores! Ceux-ci sont gérés de la manière suivante. Tout d'abord, qu'est-ce qu'un sémaphore? C'est une structure système qui possède sa propre liste des commandes en attente le concernant. Donc, à une fonction se mettant en attente d'un sémaphore correspond une primitive système qui, si elle est activée, retirera la tâche de la liste des actives et la transbordera sur la liste de celles en attente dudit sémaphore. Lorsqu'une autre tâche activera ce dernier, il remettra celle qui était en attente dans la liste des tâches actives. Il existe d'ailleurs un certain nombre de primitives de gestion qui permettent de faire le va-et-vient entre les listes. Le nombre des tâches n'est pas limité, sauf par la capacité mémoire du système. Mais comment éviter qu'un nombre trop important de tâches ne ralentissent par trop le système? Pour ce faire, on dispose d'un système de priorité des besoins. Qu'est-ce à dire concrètement?

## De la priorité des tâches

En OS9, chaque tâche reçoit lors de sa création un âge initial. En pratique, lorsqu'une tâche vient juste d'être exécutée, on lui affecte automatiquement une priorité qui correspond à cet âge initial. Puis, on par-

continued on 15

STILL LOOKING FOR OTHER  
COCO PUBLICATIONS??

TRS-80 COMPUTING

THE BI-MONTHLY MAGAZINE FOR  
COLOR COMPUTER USERS

TRS-80 COMPUTING IS A NEW BI-MONTHLY  
MAGAZINE OUT FOR COLOR COMPUTER USERS.  
EACH ISSUE GIVES YOU UP TO 35 PAGES OF:

- \* FEATURE ARTICLES
- \* PROGRAMMING TUTORIALS
- \* BASIC PROGRAMS  
(games, utilities, graphics, etc...)
- \* PRODUCT REVIEWS \* HINTS/TIPS
- \* A NEW OS-9 COLUMN (coming soon)

Each bi-monthly issue has a different editorial theme. Ranging from beginner's guides, utilities, business, graphics, etc... We are currently looking for other CoCoers to contribute their programs/suggestions to the publication. We also run a CoCo Club and sell software (write for free catalog).

SEND CHECK/MONEY ORDER TO:	Subscription Rates:
TRS-80 COMPUTING	TRIAL ISSUE: \$1.75
65 OAK ROAD	6 ISSUES: \$12.00
CANTON, MA. 02021	12 ISSUES: \$17.00

continued from 14

court la liste des taches actives en sens inverse (en remontant) dans les ages) et on place ladite tache juste avant celle qui s'avère moins agée qu'elle (une sorte de droit d'aînesse en somme!). C'est surtout au moment de l'insertion de la tache dans la liste des taches en attente qu'intervient cette notion de priorité. De ce fait, si la tache est extrêmement prioritaire, elle sera placée immédiatement en tête de liste et sera exécutée automatiquement. En revanche, la tache la moins prioritaire sera mise en queue de liste et ne sera exécutée que beaucoup plus tard. Il faut bien, tout de même, faire vieillir les taches; sans cela, ce serait toujours les memes qui s'exécuteraient et, en fin de compte, on se retrouverait avec un système monotache, ce qui n'est vraiment pas le but du OS9. Chaque fois que le séquenceur active une tache de la liste de celles en attente, il en profite pour incrémenter de 1 l'age de toutes les autres. De ce fait, celles-ci vont remonter lentement mais sûrement "le cours des ages". Prenons le cas de trois taches qui, au même moment, ont toutes la priorité (ou l'age, comme vous voulez) 127, et qui, de plus, figurent toutes dans la liste. La tache placée en tête de la liste sera prise la première. Pendant qu'elle s'exécute, le séquenceur aura fait vieillir les deux autres taches qui, ainsi, se retrouveront toutes deux avec la priorité 128. Une fois exécutée, la première tache est remplacée en queue de liste. C'est alors au tour de la tache la plus avant dans la file et possédant une priorité 128 d'être exécutée. Et ainsi de suite... C'est là un des aspects les plus importants du OS9, à savoir cette capacité de gérer le timing des taches, qu'elles soient actives ou en attente. Abordons maintenant un autre aspect de ce système d'exploitation: la façon dont il gère la mémoire adressable. L'unité conceptionnelle mémoire sous OS9 est constituée par ce que l'on appelle un module, structure mémoire ayant une taille donnée. Les modules peuvent se situer soit en mémoire vive ou morte, soit sur disque. Lorsqu'on demande le chargement d'un module, le OS9 se sert d'une liste de ceux qui sont présents en mémoire vive; s'il trouve les modules cherchés dans cette liste, il crée ce que l'on appelle un "process-control-block" qui contiendra les registres d'exécution de la tache. C'est ce qui permettra de déposer un pointeur dans la liste des taches en attente. Systématiquement, tous les programmes doivent être conçus de manière à être relogeables.

Un compteur et des gestionnaires

Pour pouvoir faire tourner de très grosses applications tenant sur le volume d'un disque et non sur le volume mémoire, on dispose

continued on 16

### Erich Sweaney Software

Save 10% off any software offered by Erich Sweaney Software. This coupon must be present with your next order from Erich Sweaney Software. Offer expires: December, 1990. Send to: Erich Sweaney Software  
P.O. Box 45434  
Tacoma, Washington 98445

**SAVE \$15  
WITH THIS COUPON  
ON A SCSI INTERFACE  
WITH R.T.C.**

**OR \$15 ON A 2 CHANNEL  
DUAL COMM BOARD**

**FROM:**

 **KEN-TON  
ELECTRONICS  
187 GREEN ACRES RD.  
TONAWANDA, NY 14150**

**Bowling League Secretary  
10% discount on all programs  
(valid thru 12-90)**

**TOMELA\*CO  
P.O. Box 2162  
Doylestown, Pa 18901-2162**

continued from 15

d'un compteur décomptant le nombre d'utilisateurs sur un programme. Ainsi, chaque fois que l'on demande à un programme de s'exécuter, le compteur s'incrémente de 1. Lorsque le compteur revient à zéro (absence d'appels pendant une période plus ou moins longue), le programme se 'délie' tout seul, ce qui permet de libérer de la place mémoire pour faire des overlays (surimpressions). Si l'on veut qu'un programme demeure résident en RAM, on effectue alors un chargement manuel qui place le compteur à 1 dès le départ. Lorsque les processus libèrent leur PCB, à chaque fois le compteur est décrémenté mais il demeurera toujours au moins à 1. Signalons maintenant un désagrément inhérent à la structure même du OS9; chaque fois que l'on affecte un module en mémoire, celui-ci ne peut plus être bougé par la suite, tant et si bien qu'au bout d'un certain temps on risque fort de se retrouver en possession d'un véritable patchwork (bouche-trou) mémoriel. Le OS9 repose sur une vaste panoplie d'utilitaires: les managers. Ceux-ci sont définis pour toutes les entrées/sorties séquentielles: console, imprimante, port série, disque, etc... On dispose à ce niveau de fonctions spécifiques permettant de tirer la meilleure part possible du gestionnaire de fichiers. Ces appels système

se décomposent en block-file-manager, sequential-file-manager et pipe-file manager, ce dernier offrant la possibilité, au lieu d'utiliser des fichiers séquentiels comme son prédécesseur, d'avoir un fichier sous forme de file, ce qui permet de désynchroniser deux tâches. On obtient de la sorte une tâche productive envoyant des données dans un pipe-line et une tâche 'ouvrante' qui ouvrira celui-ci à l'autre bout de la 'canalisation'. On crée de ce fait des tampons et donc une séparation entre les diverses tâches. Chaque fois que l'on dispose d'entrées/sorties au niveau d'une tâche, l'intérêt du pipe-line réside dans le fait que, si les tâches n'ont pas des vitesses d'exécution identiques, la bufferisation permet de profiter du temps CPU pour commencer à vider les pipes. Question: Comment une tâche se libère-t-elle d'un pipe vide? Tout simplement la tâche se met en sommeil et ne sera remise dans la file des tâches actives que lorsque la tâche productrice enverra à nouveau quelque chose dans le pipe. C'est notamment le cas du spooler dont nous parlions au début de cette étude.

(Editor's Note: The second part of Claudes "Initiation au OS-9" will be printed in the next issue.)



**Burke & Burke**

P.O. Box 58342  
Renton, WA 98058



TOLL-FREE U.S. ORDER HOTLINE:  
1-800-ADS-AHQY 1-800-237-2409

TECHNICAL SUPPORT &  
INTERNATIONAL ORDERS:  
206-235-0917

WASHINGTON RESIDENTS PLEASE ADD 8.1% SALES TAX. Minimum U.S. shipping \$3.00; \$4.00 to Canada. \$2.75 U.S. COD charge. Please allow 2 weeks for delivery. U.S. overnight or 2-day delivery available for in-stock items. Software upgrades \$5.00 each (free with orders over \$25).

## QuarterMeg

256K memory upgrade  
for CoCo 3: \$89.95!



Price includes 4 memory chips at our current reference market price. Due to fluctuating market conditions, prices are subject to change without notice.

**A New Breed of CoCo 3 Memory Expansion**  
Uses existing CoCo 3 64K x 4 memory chips!

Our revolutionary circuit combines four 64K x 4 memory chips on the QuarterMeg board with the four identical memory chips in the 128K CoCo 3 to double your OS9 and BASIC memory to 256K. Piggy-back upgrades to 512K!

Zero-K QuarterMeg (no chips) -- \$39.95

Also available: Standard QuarterMeg (4 chips), Full QuarterMeg (8 chips) & Fat QuarterMeg (512K -- 16 chips)

>>> MARKET PRICE <<<

New!



## File System Repack



Your OS9 disks are suffering from a bad case of fragmentation, and **\$29.95** we've got the cure.

Did you know that OS9 gets less efficient (and just a little slower) every time you use it? It's true! As you modify or create files, OS9 breaks them up into smaller and smaller pieces scattered randomly across your disks. Smaller pieces mean slower disk access.

Our new File System Repack program examines each file on your hard or floppy disk. It reverses the effects of fragmentation by gathering up and combining pieces of files. In addition to the immediate benefit of a faster system, our program also reduces disk head movement -- in the long term, decreasing wear on your system's mechanical parts.

## Real BASIC for OS9! R.S.B. V1.3 \$39.95

Burke & Burke's R.S.B. software gives you a complete, OS9-compatible version of Disk Extended Color BASIC. We've added new software for OS9-style graphics, sound, printer, and disk I/O. The BASIC you know and love is now running under Level 2 OS9 windows!

R.S.B. loads and saves files using OS9's file format, so we've also included utilities to transfer BASIC programs and data files between OS9 and BASIC disks. Of course, you can't use R.S.B. to run machine language programs, and some BASIC commands work slightly differently under R.S.B.

Requires CoCo 3, 256K RAM, floppy controller with either Tandy Disk BASIC or DISTO CoCo 3 CDOS, and Level 2 OS9.

## CoCo-XT Hard Disk Interfaces

NO HALT • 1 or 2 hard drives • 30% faster than SASI • Uses PC-type hard disk drives & controllers • 5 Meg to 120 Meg per drive • Does not use interrupts • Multi-PAK recommended • Includes EZGen boot file editor for easy installation • CoCo XT-RTC includes real-time clock

CoCo XT \$69.95 CoCo XT-RTC \$99.95

XT-ROM AUTO-BOOT ROM . . . Automatically boots OS9 from your Burke & Burke hard disk at power-up. Use XT-ROM as a convenience, or for fail-safe CoCo operation in unattended BBS, home security systems, etc.

XT-ROM \$19.95

**4' hard disk cable set \$17.50**

### HYPER-I/O \$29.95

Modifies Disk BASIC to use hard disks (CoCo XT, DISTO, LR), RAM disks, & any mix of 35-160 track floppy drives. Fully reset protected, 16K EPROM-able.

### HYPER-III \$12.95

RAM disk and printer spooler add-on for HYPER-I/O. Requires 512K CoCo 3 and HYPER-I/O.

### HYPER-I/O Utilities \$21.95

Kevin Berner's wildcard copy, delete, and file search utilities for HYPER-I/O

### HYPER-I/O Disk Doctor \$17.95

Kevin's second utility package. Find bad disk sectors, edit GAT/FAT, etc. Both utility packages for \$37.95

### EZGen Version 1.06 \$19.95

Powerful OS9 bootfile editor. Change module names, add or delete modules, patch bytes, or rearrange modules. Works on other files, too.

### PERTASCII \$19.95

Level 2 OS9 scrambled-letter word game for 1-16 players. Play against the computer's 15,000 word dictionary or friends. 256K.



## The NEW CoCo's??

We've tried over the last two plus years to be first with as much "news" as possible here at *Clipboard* and this time is no expectation. Most of our readers have heard that there will be two new computers introduced to the CoCo market this coming fall. Both of these machines were shown, at least in prototype form, in April at the Rainbow-Fest in Chicago. Since not all of us could be in Chicago we have edited press releases about these two new computers and are presenting them here, side by side.

It is important to remember that this article is not a side by side comparison of two in hand running machines, but rather a compilation of reports and press releases we have obtained.

### TC9 - Tomcat (tm)

Manufacturer: Frank Hogg Labs / FHL  
204 Windemere Road  
Syracuse, NY 13000  
(315) 469-7364

Price: Varies based on items selected

Operating System: Not announced at press time

Information from press releases obtained primarily from Hayes BBS.

The TC9 Tomcat (TM) is a major improvement over the CoCo 3.

- The TC9 is over 25% faster
- The TC9 uses a PC compatible keyboard
- The TC9 has two "real" serial ports
- The TC9 supports a serial mouse
- The TC9 has a parallel printer port
- The TC9 has provisions for 512K on board RAM or it can use a CoCo 3 512K memory upgrade
- The TC9 can be upgraded to 1 megabyte with the Disto 1 Meg. upgrade with no soldering, just plug it in.
- The TC9 has 8 bit D to A and A to D. Eight bit provides better sound and a high resolution joystick, 256 vs 64.
- The TC9 supports an internal speaker
- The TC9 has the standard CoCo bus so

that CoCo cartridges can be used.

The TC9 board can be powered by any standard PC power supply. This also allows installing the board in most PC clone cases.

The TC9 will work with most if not all OS9 software.

The TC9 will have RSDOS compatibility through 3rd party vendors

The TC9 is K-Bus compatible

K-Bus compatibility is important because it allows interfacing the TC9 to the 68000 and even the 68030 cpu! By installing the TC9 in a K-Bus 68K system, the Tomcat becomes a dual processing system! When in OS9 Level II mode the 68000 becomes a co-processor to the TC9, like an accelerator to Level II. We can expect a 2 or 3 fold improvement in performance! When the 68000 is the master under OS9/68K, the TC9 acts as a co-processor to 68K. Switching back and forth between systems will be easy and will allow a smooth transition from OS9 to OSK. It is not necessary to jump to OSK to get the benefits of the 68000, but it provides a smooth transition when and if you decide to make the move. You go at your own pace, upgrading as you desire, and at each point you get a significant improvement in performance, for a very slight cost.

### EXPANSION

Once a K-Bus backplane is added, (it is not required for TC9 operation) the world of 68K is open to you. The logical first step is to add a 68000 CPU which will immediately speed up Level II operations by several factors and opens the door to running OSK. No other additions are needed to run OSK, as OSK will run in the TC9 memory and use TC9 I/O. For further performance increases additional boards, memory, I/O etc. can be added to the K-Bus. It is even possible to have several TC9's in the K-Bus for a multi-processing system! Memory limits are 16 Megabytes of which more than 14 Megabytes can be RAM!

They are backplane sizes from 4 to 16 slots and a 20 slot bus is under consideration. The backplane itself is inexpensive.

continued on 18

## CoCo Clipboard Magazine

continued from 17

sive so that if you outgrew your first bus you could transfer all your cards to a bigger backplane for little cost. Because of the bus concept upgrades to future CPU's only requires adding that CPU to accomplish it. For example, you could start with a 68000 and later replace that with a 68030 and still use ALL of your other cards.

When new cards such as the 68040 become available, you could add those too. Even capabilities, not thought of today can be added by just adding a card!

This is upgrading without having to throw anything away. Even if you eventually switched over to 68K completely the TC9 still functions as a multi-function graphics co-processor. Our Hi-Res graphics board, now in design, will have its own keyboard interface and video memory so that it can be used with the TC9. Several of either cards can be used in the same system, making for the first multi-processor, multi-user, multi-graphics system for OS9 and OSK! Because of the wide variety of K-Bus boards available and those under development, the possibilities for the future are unlimited.

SHOULD YOU GET ONE?

If you currently own a CoCo 3 and use it for both RSDOS and OS9 Level II the TC9 Tomcat is your road to the future. It will run your current software faster and give you powerful new features and performance at modest cost. You get the ability to expand at your own pace, at low cost, the way you want to do it, for your future.

THE FUTURE.

The Tomcat is the computer for the 90's. We have put all of our knowledge and experience into the creation of the Tomcat. We believe it is the best choice for you and for us. We create computers because we like to use them, not because we like to sell them. Every computer we've made has been one we've wanted for ourselves. The Tomcat is the best we've done... so far.

MM1

Manufacturer: Kenneth-Leigh Enterprises  
1840 Biltmore Ave. NW  
Washington, DC 20009  
(202) 232-4246

continued on 19

"Easy to install and use...  
Powerful...Excellent..."

### CEBBS

"Programming in all areas  
of the BBS is very crisp..."  
"The best BBS I have seen for the CoCo..." (Rainbow Nov '89)

The BEST BBS for your CoCo 3! With over four years of research and development, CEBBS brings you software second to none! No other BBS can match its power! Here are just a few of the many features: File transfer system complete with Xmodem, Ymodem, ASCII, keywords, filetypes, and more! \* Full ANSI graphics (host and remote) \* Four ML programs (such as clock and calendar) \* 30 files needed for operations! \* All functions controlled by text menus from your word processor! \* Remote access for authorized persons! \* Full control over each users access to ALL options! \* Full 48 page manual! \* Compatible with RS-DOS®, Hyper-I/O®, ADOS-3®, and Disto®! Requires CoCo 3, RS-232 Pak, and auto-answer modem.

**Only \$49.95! (Retail: \$59.95!)**

### CEBBS Additions

**CEBBS Online Programs Disk:** Contains 7 programs for CEBBS! Includes: 3 graphics games, voting booth, personal profiles, BBS autolist, and much more! **Only \$18.95! Special: Order with CEBBS or upgrade and save \$3.00! You pay only \$18.95! Upgrade to CEBBS Version 2.1 Only \$8.95 + S/H! Enclose original disk with order!**

### Hyper-I/O® Programs

**Hard Drive Utilities:** Wildcard copy, delete, search, compressed backup, and much more! A must have! (Rainbow Jun '89) **\$21.95**

**Disk Doctor:** Check floppy disks and hard drive sections for bad sectors and lock them out for good! (Rainbow Aug '89) **\$17.95**

**Hard Drive Zap:** Recover lost or deleted files quick and easy! Repair crashed directories! 7 page tutorial for step by step recovery! A snap to use! Works on floppies too! (Rainbow Jul '89) **\$21.95**

**Auto-Park Utility:** Park all active device heads after a preset amount of time! Excellent for unattended (CE)BBS use! **\$12.95**

**Ramdisk Driver:** Create an 80 track ramdisk in memory! Adds 158 granules of disk space to your 512k CoCo 3! A BBS must! **\$8.95**

Hyper-I/O® is a product of Burke & Burke

## BASIC Windows

"Cost effective alternative to [OS9]...easy to use..." (Rainbow Nov '89)

Are you a serious Disk Basic user? Tired of hearing about OS9's incredible multitasking capabilities? If so, here's the program just for you! BASIC Windows will divide your 512k CoCo 3's memory into 6 independent, multitasking environments! Run up to 6 BASIC programs (and some machine language programs such as **Radio Shack's Edtasm®**) in memory simultaneously! Imagine running spreadsheet calculations in one window while playing your favorite video game in another! Switch between programming projects in a snap! Have up to 96 files open at one time! Runs at 2 Mhz clock speed with no printer/disk problems! All BASIC commands fully supported! Unleash the CoCo 3's power! Requires 512k CoCo 3.

**Only \$34.95! (Retail: \$39.95!)**

**KB Enterprises**  
435 Brightwaters Drive  
Cocoa Beach, FL 32931

All programs supplied on 5 1/4 inch disks. Check, money order, COD (US only), Visa, or Mastercard accepted. FL residents, add 6% sales tax. Shipping: US and Canada: \$3.00; COD: Add \$4.00; Foreign Orders: 10% of total (\$5 min). US currency only please. Mail Orders: Please include signature / date. Phone Orders (EST): Business Hours (9am-5pm) at 407-799-3282; After Hours (5pm-9pm) at 407-799-3253; Data Hours (5pm-9am) at 407-799-3282 (30meg ANSI CEBBS system! 300/1200 baud at 8-N-1) Dealer inquiries welcome!

continued from 18.

Price: Not Available at Press time  
Operating System: Not Available at Press time

Thank you for giving Kenneth-Leigh Enterprises an opportunity to tell you about our community's new computer. We created this computer to bring you into the future -- without the shock of high prices, incompatibility, or difficulty of use. Our system offers exceptional speed, crisp natural graphics, stereo digital sound that outperforms Compact Disk -- all affordably. In many ways, you designed this computer. Kenneth-Leigh Enterprises has surveyed hundreds of Color Computer users from across the United States and Canada to find out exactly what they wanted in their next computer.

You requested a system in the tradition of the Color Computer but updated for the Nineties and beyond. Amazing graphics, high performance, and multitasking windows. In 1990 we will introduce such a computer.

-- Compatibility: --

The vast majority (over 80%) of sur-

vey respondents did not require that the new computer be compatible with Disk Extended Color Basic ("RSDOS"). But it is important to us to provide easy ways to protect users' existing software skills.

Our first solution -- the OS Gateway -- (will debut at the Chicago RAINBOW-Fest.) The OS/Gateway integrates OS-9 Level 2 with the new computers resources. By joining these two computer systems with the OS/Gateway you can run favorite programs with ease when you need to.

Another hardware solution will be introduced late this summer. RS-DOSers will get RS-DOS compatibility and access to many of the great new programs too!

Kenneth-Leigh Enterprises will also be announcing a series of software answers to RS-DOS users request for ease of use and familiarity. Our software will add power to the RS-DOS skills of our customers.

-- Designed for the next millennium - and your pocket book. --

We created the new computer with two design goals from which we never wavered:

continued on 20

#### SUPER BACKUP UTILITIES

★★ Requires minimum 64K ★★

- \* Supports either standard or OS-9 disks
- \* Does not abort on errors; allows you to copy disks that contain bad sectors
- \* Errors are reported by track and sector number
- \* Utilizes all your RAM. 512K version will make multiple copies of a disk without having to re-insert it.
- \* A must for single-drive backups
  - Copies 10 tracks at a time using 64K
  - Copies 19 tracks at a time using 128K
  - Copies an entire 80-track disk using 512K!
  - Less disk swaps means a big savings in time

#### SUPER BOOT

★★ COCO-3 ONLY ★★

- \* BOOT your DECB (RS-DOS) disks by typing DOS
- \* Automatically sets printer baud rate
  - Supports 300, 600, 1200, 2400, 4800, 9600
- \* Automatically sets number of disk tracks/sides
  - Supports 35, 36, 40, 80--single or double
- \* Automatically sets drive step rate
  - Supports 6, 20, 30
- \* Displays directory in two columns, up to four 'pages'. As many as 128 entries can be displayed without scrolling off the screen
- \* Select file to load and press enter--LOADs and RUNs or LOADm and EXECutes automatically

Each program \$15.00 (U.S.). Both \$25.00

Send check or money order to:

C. ENGLAND  
128 Shepherd Dr. N.E.  
Calhoun, GA 30701

**ec** the envelope for the OS-9 C compiler!

ec lets you:

- Use your favorite window-based editor - no need to learn new editing commands
- Change the compiler flags from inside ec. - no need to look up obscure codes
- Adjust the screen colors to your preference
- Use the directories you want for the library and compiler - such as /r0, /h0, /d0

**only \$25.00**

To use ec, you'll need:

a Coco 3, 512K RAM, OS-9 Level II, RunB, SysCall, gfx2, and the Radio Shack C compiler.

To order or for more information, contact:

**RJR**  
Systems

P.O. Box 560 Copiague, N.Y. 11726

## CoCo Clipboard Magazine

continued from 19

Respect your current investment in software, hardware, and learning; and provide you with the latest technology at a low price.

The new computer offers a modern multitasking, multimedia environment that outperforms PCs, Amigas, Ataris, MACS and even some work stations. Its features make it the last computer you will ever need. It is easier to use than a MAC and easier to program than IBM PC-compatibles. And its multimedia capabilities are included by Philips BV and Sony Corporation in state of the art consumer electronics.

-- Software support like you've never seen. --

Kenneth-Leigh Enterprises has been working hard on software support. Our software commitment translates into satisfied customer and a permanent place for our products in your home or office. Scores of CoCo vendors from around the world have been working to bring databases, telecommunications and games to the new computer. Also, look for hundreds of UNIX and UNIX style applications to be available on the new computer, many of them free!

Even more importantly since multimedia technology will be the rave of the 1990's the new computer will have a long life. Amiga and Compact Disk Interactive software developers are already attracted to it.

And thanks to our hard work at Kenneth-Leigh Enterprises, in late 1990 you will be able to run thousands of programs developed under MS-DOS!

That's not all -- we are including free software with the new computer that is sure to please everyone.

The following are technical Specs supplied by KLE

The basic system includes case, power supply, operating system, cables and one CPU board. The CPU board contains everything you need to start enjoying this computer right away, with high powered, simple to use professional features:

\* Signetics 68070 CPU (Motorola 68000 compatible) running at 12.5 or 15 mhz. The CPU is designed expressly for multimedia computing.

continued on 21

### Erich Sweaney Software

#### The CoCo Notes Newsletter

Only \$10.00 For a yearly (Six issues) subscription, \$2.25 For a single issue. For only \$10.00 you will receive one of the BEST MAGAZINES OUT TODAY for the CoCo 1, 2, or 3, PLUS a on-disk version, with a display program. Imagine, receiving a bi-monthly magazine, filled with over 15 ARTICLES for OS-9, Basic, Basic09, RSDOS, Machine Language and many others. This magazine is designed to help EXPERT and beginning users. Comments:

"I really enjoyed my first issue of your magazine. Enclosed is a check for \$10.00 for a years worth of your magazine." Sub Craig

**Slam Bam** - CoCo 3 128k Only \$15.95

Have you ever dreamed of slam dunking? We'll now take your CoCo into the world of slam dunking, over 27 different kinds of slam dunks. One or two players.

"I definitely recommend that you add Slam Bam to your Software collection!" TRS-80 Gamers

**OS-9 L2/Basic09 Explained for**

**BEGINNERS Only \$16.95**

A excellent reference book for EXPERT OS9 users. A step by step guide through OS9 and Basic09 commands.

Send to: Erich Sweaney Software

P.O. BOX 45434 Tacoma, WA 98445

(206)-535-9733 Check or Money

Orders are Welcomed.

### Announcing WPS<sup>hel</sup>

#### from ColorSystems

A New Word Processing Oriented Graphics Shell  
for your Color Computer 3 and OS9 Level 2

FEATURES: "Pull-Down" Menus  
User Customizable

Extensive use of Overlay Windows

Use with your favorite Text Editor,  
Text Formatter & Spelling Checker  
(not included)

Requires a minimum of 256K of RAM  
and the Windint Module from your Multi-View Disk

Complete with Full Documentation & Support

for only **\$22.00**

(\$25 CDN)

NC Residents Please Add 5% Sales Tax

Send Check or Money Order to

**ColorSystems**

**P.O. Box 540**

**Castle Hayne, NC 28429**

**(919) 675-2426**

Ask for our FREE catalog  
of OS9 Games & Utilities!

continued from 20

\* Graphics resolution from 320 x 200 to 720 x 480 (interlaced) with intermediate modes.

\* From 16 to 256 colors on screen, depending on resolution mode.

\* Two serial ports, one DB-9 one DB 25 for your mouse, joystick printer - one is factory configured for MIDI.

\* PC keyboard port for 101 key XT style keyboard.

\* RGB Analog output for your CM-8 or Magnavox monitor.

\* Operating system included.

\* Direct memory Access (DMA) floppy disk controller for smooth multitasking.

\* 3.5, 1.4 meg floppy drive @ 3 ms access track to track, 250 Kilobit/sec transfer rate.

\* One megabyte of RAM.

\* Optional daughterboard expands palette to 16 million colors.

Our second board attaches to a header on the first board. It supports up to eight megabytes of RAM, gives you outstanding sound and provides extra I/O ports including support for the OS/Gateway, transferring data at 50 Kbytes/sec between computers

\* DMA SCSI host adapter built in - supports hard drives, CD-ROM drives and other 8 bit SCSI compatible devices; transfer at 2 Megabytes/sec. or faster.

\* Memory upgradable to 2 or 8 megs with SIMM memory.

\* Stereo 8 bit DMA port for sound sampling and stereo playback (samples at up to 350khz, sampling rate software selectable.)

\* One powered DB-9 serial port for Logitech style mouse, modem or terminal.

\* Two parallel ports for parallel printer and OS/Gateway support.

\* One CoCo joystick port with 8 bit resolution.

continued on 22

## Exclusive!

### CHI PagesE v. 2.0



Desktop Publishing, Greeting Card Designer, Calligrapher or CAD for the CoCo3. Page size 640x384. Pull-down menus, icons and dialog boxes. Import ASCII text or enter from keyboard, mix text with graphics, flow text around irregular shapes. Magnify, flip, enlarge, reduce, stretch and slide screen in seconds. Page preview, select printers from the pull-down menu. Req. CoCo3, Tandy Hi-Res interface, RGB/CHP monitor, joystick/mouse, Epson, Star, Panasonic, NK1000, DMP105/106 printer... still only \$49.95



### CHI Clipart Set 1 Set 2



Each Set contains 672 clipart pieces for all versions of CHI Pages only. Stunning and detailed... each Set: only \$29.95



### CHI Fonts



59 "True" like fonts for the Colorfax, Newspaper series and RAT... only \$19.95



### CHI Lettrex

Letter-quality text directly from your current software. 14 great MLQ text fonts. Req. 64K CoCo 1/2/3, any monitor, 1 drive, mouse, Epson or compatible printer.. \$24.95



### CHI D-Link

Tele File Transfer Program. Graphics interface. Req. CoCo3, RGB or CHP monitor, modem, 1 Drive, joystick/mouse... only \$24.95



UPGRADE POLICY: CHI Pages V.1.0 owners can upgrade to CHI PagesE v.2.0 by sending the original system disk, copy of the sales slip and \$12.00 to the address listed below.

Above programs sold exclusively through



1917 Madera St. #8  
Waukesha, WI 53186  
Phone (414) 549-0750  
Call for a Free Brochure



Sorry, no Credit Cards/COD's - Check or Money Orders only  
All Orders add \$3.00 S/H, WI Residents add 5% Sales Tax

## MVCanvas 2.0 - OS-9 Paint Program

Finally, a professional OS-9 Level II paint program is available for the Color Computer 3. MVCanvas not only supports true windows, MVCanvas is the ONLY Color Computer graphic editor that gives you more choices than just a 320 by 200 pixel, 16 color graphic resolution.

Now with MVCanvas, the graphic editing power found only under RSDOS based products is married with the benefits of a multitasking windowing environment to produce one of the most versatile and powerful graphic packages available to the Tandy Color Computer 3 user!

MVCanvas is a mouse/joystick/keyboard driven graphic editor for the OS-9 Level II, Multi-View windowing environment.

MVCanvas features include:

- o Multiple Screen resolutions: (Four different Resolutions) \* 640 by 200 with 2 or 4 colors & 320 by 200 using 4 or 16 colors.
- o Mouse/joystick/keyboard controlled.
- o Select up to 16 colors out of a palette of 64.
- o IMG (Rescan) digitized picture importing
- o VZF Graphics format & VZF Squashing (Compression)
- o Palette animation and Remap
- o Instant grey scaling (in 640x200 mode)
- o Multiple font support
- o Clipboard includes Copy, Cut & Paste, Flips, Invert and Remap
- o Plain, inverse, transparent, bold, underline & proportional text
- o Drawing features include: Circle, Ellipse, Radians, Lines, Pencil, Brush, Fill, Erase, Spray, Box, Bar and Stamps.
- o Printers supported: Epson, DMP (Tandy), IBM, Gemini, Star & Citich

System Requires CoCo3, 89-9 LVL II, Disk Drive, 512K  
Only \$49.95!! + \$3.00 S/H Rev. Res. add 6.5% sales tax, C.O.D. Orders Add \$2.50

Send Check/Money order to:  
Hyper-Tech Software / 4341 Gannett Cir #174 / Las Vegas, NV 89103  
Phone: (702) 362-5346  
Or

C.O.D. Orders may also be placed on the following Computer Networks

CompuServe: 72300,1433  
Internet: 72300,1433@CompuServe.COM  
Delphi: MIKEHAALAND

## Advertisers Index

Kenneth-Leigh Ent .....	IFC
CoCo Pro .....	4
Orion Tech. ....	6
After 5 .....	8
TOMELA*CO .....	9
ClipDisk .....	11
CoCo Clipboard .....	12
TRS-80 Computing .....	14
Burke & Burke .....	16
KB Enterprises .....	18
Carl England .....	19
RJR Systems .....	19
Eric Sweeney .....	20
ColorSystems .....	20
Coless Computer Des. ....	21
Hyper-Tech .....	21
Freedom Village .....	22
Bob van der Poel .....	22
Danosoft .....	IBC
Ken-Ton .....	OBC

## Finally

An answer for America's dying teens!

For your free copy of this dynamic and powerful book, call us today at  
**1-800-VICTORY.**



### Also;

See and hear young people who have already found the answer at  
Freedom Village, USA in Lakemont, N.Y.

Check your local Christian radio and television stations for the Victory Today program.  
For more information write  
Freedom Village, USA Lakemont, NY 14857

continued from 21

\* One Hi-Res Tandy mouse port.

\* RTC, battery backed with 56 bytes of non volatile memory.

## CoCo Clipboard Magazine

### Great OS-9 Software

VED, OS-9 Text Editor.....\$24.95

The best editor for OS-9 just got better. Version 2.0 of this best seller now includes 36 definable macros, case-switcher, and even more speed. See the review in Mar/Apr Clipboard. Works with 128 or 512K.

Upgrades to version 2.0 (with new 28 page manual) are \$12.00 with proof of purchase.

VPRINT, OS-9 Text Formatter.....\$29.95

An unbelievably powerful formatter. Features include complete proportional font support, multiple columns, footnoting, indexing, table of contents. And much more. Comes with 120 page manual, demo files and extensive macro file. (512K memory recommended.)

Ultra Label Maker 9.....\$19.95

Turns your printer into a printing press for labels. WYSIWYG previewing. Supports ALL printers. Useful, and lots of fun. One of Rush Caley's "top 10." (Requires 512K CoCo3) CoCo2/3 version \$14.95.

Magazine Index System 9.....\$19.95

Now you can find those references fast. Comes with extensive CoCo magazine data files. File compatible with our RS-DOS version. Another one of Rush Caley's "top 10." (Requires 512K CoCo3.) CoCo2/3 version \$14.95.

Sorry, no credit cards--enclose check or money order plus \$2.00 S/H. Complete catalogue available--send \$1.00 (free with order). Most orders shipped next day!

Bob van der Poel Software  
P.O. Box 57 P.O. Box 355  
Wynndel, B.C. or Porthill, ID  
Canada V0B 2N0 USA 83853-0355

# Unlock The Real Power of Your CoCo !

## "BIG BASIC" Basic Users get full control of managing all CoCo memory

COCO 3'S MISSING LINK

"Danosoft has a winner in *Big Basic*, and I would recommend it to anyone wanting to get the most out of a Color Computer 3." - Rainbow, Oct./89.

- Now you can access up to 472K of memory in a 512K CoCo or up to 92K in a 128K machine with any mix of programs and/or data. At last, you can do sizable basic programming with a CoCo 3.
- BIG BASIC creates programming windows where you can put up to 58 separate running programs, or up to 58 parts of one large program or database. Concept permits big programs to run fast.
- Chain in unlimited sized programs, or program parts, or data, from disk(s) without erasing existing programming or variables. Also works with the RGB-DOS Hard Disk system and ADOS3.
- 3 new simple basic words create the power.
- Provides for holding as many as 28 Hi-Res Graphics Screens in Memory for instant recall. Up to 4 HSCREEN1's in a 128 K CoCo.
- Modifies your basic operating system in some 70 locations but does not occupy user memory. 100 % M.L. runs in background.
- Includes 7 Demo Programs and Manual. Any disk version RS-DOS.

ONLY \$39.95 U.S. or \$46.50 CDN. + \$2.50 S & H (Add 8% PST in Ont.)

**NEW! "SUPER BIG BASIC"** Same as "BIG BASIC" except it also accesses 1 Meg. of Memory if you have CRC/DISTO's Board. \$49.95 U.S. or \$57.95 CDN. Upgrade with Proof of Purchase: \$9.90 U.S. or \$11.50 CDN. Add \$2.50 S&H (Add 8% PST in Ont.).

**"BABY BASIC"** If you need more memory for Basic program lines, this Tutorial will show you how to store and execute them from anywhere in memory; and how to chain in any number of program modules from disk without erasing variables. Includes Disk with 7 basic enabling subs and a demo program. For any CoCo with 64K or more. Doesn't replace "Big Basic". Only \$8.95 U.S. or \$10.50 CDN. + \$2.50 S&H (Add 8% PST in Ont.).

## "MEMORY MASTER"

OUR FAVORITE PROGRAMMING TOOL

"*Memory Master* is a unique hacker's program offering about all you could ask for in a disk and memory utility." - Rainbow, Sept./89.

- Scan, Edit, Copy, Printout any memory in your computer or on disk. Fix disks. Restore killed files.
  - Fast entry of M.L. Listings.
  - Dual Windows! Runs 2 Basic Programs at once!
  - Disk chains unlimited amounts of program sections or data.
  - Includes Demo Program and Manual.
  - Any CoCo (at least 64K) with 1.1 or 2.1 Disk Extended Basic.
- Only \$24.95 U.S. or \$28.95 CDN. + \$2.50 S & H (Add 8% PST in Ont.)



## "BIG RAMDISK" (512k CoCo3 V.2.0 or V.2.1)

"Danosoft's *Big Ramdisk* is a thoroughly useful utility that combines a great product with the ease of use that marks a winner." - Rainbow, April 1990.

- Copy or backup your programs or data to "BIG RAMDISK" and get the speed of program/data saving or loading to an "in memory" M.L. device. ("COPYDISK" Utility included.)
  - Great for use with all other programs on this page (except "Simply Better") and most commercial software.
  - You can install, re-install, format and reformat from direct mode or from a program without erasing programming or variables. Does not occupy user memory, but can be user located elsewhere if needed.
  - **NEW!** Works double if you have CRC/DISTO's 1 Meg. Memory Board.
  - Your choice of one big 158 granule ramdisk (80 tracks-360k) or two 68 or 78 granule ramdisks (35-40 tracks to 360k total), depending on your DOS. (i.e. RS-DOS, "BIG DISK", "DOUBLE40", etc.) Allows 4 physical drives and 2 ramdisks. (4 ramdisks to 720K with 1 Meg. Board.)
  - Ramdisk files and directory do not erase with a reset or if a program crashes. This lets you use some programs that need a Coldstart to exit.
- ONLY \$12.95 US or \$14.95 CDN. + \$2.50 S & H (Add 8% PST in Ont.)

**"GRAPHICS UTILITY"** If you want to store multiple Hi-Res Graphics screens in CoCo3 memory for instant recall, this Tutorial is for you. Load/Save graphics screens to memory from disk. Instantly switch them into your program. Max capacity is : HSCREENS 1 & 3 : 512K = 27 ; 128K = 3. HSCREENS 2 & 4 : 512K = 13 ; 128K = 1 Has Disk & Demo. Only \$8.95 U.S. or \$10.50 CDN. + \$2.50 S&H (Add 8% PST in Ont.).

## "UTILITIES PACKAGE"

ACCESS BOTH SIDES OF YOUR DRIVES

"Must - have software for the disk user"

- Rainbow, Nov. /89.

"BIG DISK"

• Makes computer see double-sided drives as one 360K (80k) drive; 158 granules.

"DOUBLE40"

• Sets drives for 40 tracks each side.

"CONVERT/DISK"

• Formats 40 tracks on each side of a disk without disturbing the first 35. Doubles all your present storage.

"QUIKDRIV/6MS"

• Sets fast drive stepping rate.

"QUIKDRIV/30M"

• Fast drive shut off.

"SET FEED"

• Sets line spacing for printouts.

All are Machine Language Running in Background

For any CoCo (at least 64K) with 1.1 or 2.1 Disk Extended Basic

Only \$17.95 U.S. or \$20.85 CDN. + \$2.50 S & H (Add 8% PST in Ont.)

NOW FROM DANOSOFT! DALE RICKERT'S

Feature Packed



"Simply Better"

- Run 2 interactive Wordprocessors at once • Mail Merge • Create Indexes • Table of Contents • "..... An excellent choice at an unbelievable price." - Rainbow, April /89
- Print-Fill Forms • Displays Fonts in Colors • Displays Underlining • Print Spooling • Auto Saves • Print/Save Blocks of Text • To 480K of Text Storage • Sorts Text • Numbering • Indenting • Calculator • Tasks • Headers • Footers • Paging • Finds • Case Reversal • Help Screens • Preview "WYSIWYG" • Many More Features.

## BEST WORD PROCESSOR

Easy to use. Includes some Database Features

Will hold a customer list of more than 5000 in memory for quick recall or editing.

"Significantly Better? Mais Oui!" - Rainbow, Feb., 1990

"..... An excellent choice at an unbelievable price." - Rainbow, April /89

Includes extensive, well indexed Manual, with Tutorials.

128k or 512k CoCo3. Any disk version RS - DOS.

ONLY \$39.95 U.S. or \$46.50 CDN. + \$2.50 S & H (Add 8% PST in Ont.)

Add \$7.00 U.S. or \$8.20 CDN. for French Version of Manual

Need more info? See the Reviews of these Programs.

DANOSOFT

Box 124, Station "A"

Mississauga, Ontario L5A 2Z7

10% Discount

on purchase of  
3 or more items  
at the same time.

Order by Phone or Mail

(416) 897-0121

Shipped Airmail Same Day

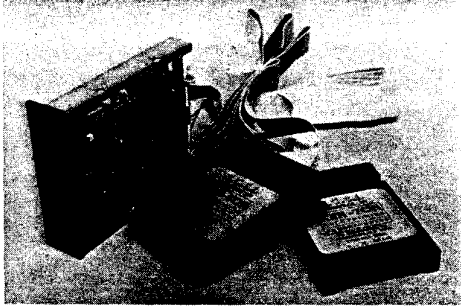
VISA

Master Card

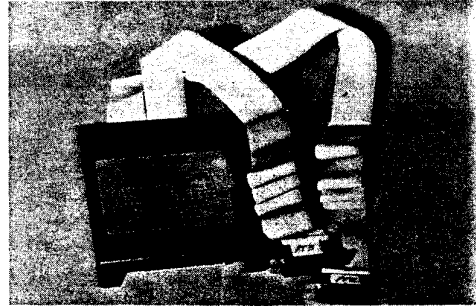
# KEN-TON ELECTRONICS PRESENTS

## SCSI HARD DRIVES      DUAL COMM PACK

1990 TECHNOLOGY 50,000 MTBF      \$74 Single    \$89 Dual



Shown w/optin for two CoCo hookup



Shown with dual ports /T1 /T2 option

20-30-42 Meg. Kits Available. Installs as easily as a floppy!

20 Meg only \$436\*

30 Meg only \$476\*

42 Meg only \$527\*

\*Call for you particular system requirements.

Our drives use the only true industry standard SCSI Interface!

Don't limit yourself to SCSI "Compatibles" that don't meet SCSI Specs!

Exceeds Original Tandy Specs!

Onboard power up reset!

Onboard +/- RS-232 Voltages!

2 - 6551 ACIA's!

Ultra Low Power Draw!

Jumper selectable up to 4 channels!

2 Independent RS-232 channels!

OS-9 Compatible!

Y Cable Compatible

**Mil Spec Quality**

**90 Day Warranty**

### SOFTWARE

RGB-DOS \$29.95    OS9 Utilities    Ultra Basic \$19.95    Y-Cables CALL    Real Time Clock \$29.95


Terms:

Check or M.O. accepted (US Funds only)

Please add \$4.00 for S&H

Phone Orders are welcomed!

CALL 1-716-837-9168 (24 hr. order line)

 **KEN-TON  
ELECTRONICS**  
187 GREEN ACRES RD.  
TONAWANDA, NY 14150

**CoCo**

**Clipboard Magazine**

3742 U.S. 20 Box 3, • Fredonia, N.Y. 14063

BULK MAIL  
U.S. POSTAGE  
**PAID**  
PERMIT NO. 18  
FREDONIA, N.Y.  
14063